neuromuscular junction dysfunction. Other endocrine disorders, such as hypothyroidism, hyperthyroidism, and adrenal dysfunction, can also cause ED. Because of the uncommon occurrence of thyroid and adrenal disorders in patients presenting for treatment of ED, testing of those axes is not a part of the routine work-up of ED.

Medication-Induced Erectile Dysfunction

Many commonly prescribed medications can cause or contribute to decreased erectile function. Table 71-3 lists the major classes of medications implicated in ED and suggests how commonly these medications interfere with erectile function. Changing medications may restore erectile function in some patients. However, proceeding directly to treatment of ED is usually the preferred option in all but the most straightforward cases.

Medical and Surgical Therapies

Since the introduction of sildenafil in 1998, the Process of Care Model for the evaluation and treatment of ED has been adopted. It targets the primary care provider as the initial source of care for patients with ED. Currently available therapies for ED include oral phosphodiesterase type 5 (PDE5) inhibitors, intraurethral alprostadil, intracavernous vasoactive injection therapy, vacuum constriction devices, and penile prosthesis implantation. A stepwise treatment approach starting with oral agents and progressing to more invasive therapeutic interventions should be used (Fig. 71-2). Informed patient decision making is critical to successful progression through the Process of Care pathway. Patient referral is primarily based on the need or desire for specialized diagnostic testing and management.

Oral Phosphodiesterase Type 5 Inhibitors

Current medical therapy is based on inhibition of PDE5, which degrades cGMP to inactive 5′-GMP, as shown in Figure 71-1. Sildenafil, vardenafil, avanafil, and tadalafil competitively inhibit PDE5 breakdown of cGMP. Use of a PDE5 inhibitor results in improved erectile rigidity even in patients with decreased NO or cGMP synthesis. However, not all patients respond to PDE5 inhibition. Adequate sexual stimulation and intact neural and vascular pathways are necessary to produce an adequate amount of NO and cGMP to increase deep penile artery blood flow. PDE5 inhibitors are effective in men with organic, psychogenic, neurogenic, and mixed cases of ED. The overall response rate to PDE5 inhibitors is 70%.

Unless contraindicated, PDE5 inhibition should be considered first-line therapy for most men. The combination of PDE5 inhibitors and α-adrenergic receptor blockers can result in transient hypotension. This interaction is complex and depends on the specific medication in each category. In general, it is safe to use selective α-blockers such as tamsulosin and alfluzosin with any PDE5 inhibitor. However, PDE5 inhibitors should not be used concurrently with nitrate medications because a large (>25 mm Hg) synergistic drop in blood pressure occurs in many patients. Periodic follow-up is necessary to determine therapeutic efficacy, side effects related to PDE5 inhibition, and changes in health status. Overall, 30% of men do not respond to this class of medication.

Alprostadil Intraurethral Drug Therapy

In PDE5 inhibition is not successful, an acceptable second-line medical treatment is intraurethral administration of prostaglandin E_1 (alprostadil [Muse]), which can be inserted into the urethra with the use of a pellet applicator. This method of delivery assumes substantial venous communications between the corpus spongiosum surrounding the urethra and the corpus cavernosum, and it is effective in many patients who fail oral PDE5 inhibitor medications. It is not as effective as intracavernous injection (described later). Some patients experience difficulty initiating this type of treatment, so it may be beneficial to administer the first dose in an office setting. To lubricate the urethra, patients should void before insertion of the pellet.

Up to one third of patients have normal, transient burning penile pain, and this should be discussed with the patient before treatment. Dizziness and presyncope are uncommon complications. This medication has rapid onset and minimal risk of priapism. It can be used with increased efficacy in combination with PDE5 inhibitors. Transient burning pain in the sexual partner can occur and is caused by leakage of the medication from the urethra into the vagina. This can be managed by wearing a condom.

TABLE 71-3 FREQUENCY OF DECREASED ERECTILE RIGIDITY AND EJACULATORY DYSFUNCTION BY MEDICATION CLASS

MEDICATION CLASS	DECREASED ERECTILE RIGIDITY	EJACULATORY DYSFUNCTION
β-Adrenergic antagonists	Common	Less common
Sympatholytics	Expected	Common
α_1-Agonists	Uncommon	Uncommon
α_2-Agonists	Common	Less common
α_1-Antagonists	Uncommon	Less common*
Angiotensin-converting enzyme inhibitors	Uncommon	Uncommon
Diuretics	Less common	Uncommon
Antidepressants	Common†	Uncommon‡
Antipsychotics	Common	Common
Anticholinergics	Less common	Uncommon

*Patients are able to ejaculate, but retrograde ejaculation is seen in 5% to 30%.
†Uncommon with serotonin reuptake inhibitors.
‡Delayed or inhibited ejaculation with serotonin reuptake inhibitors.

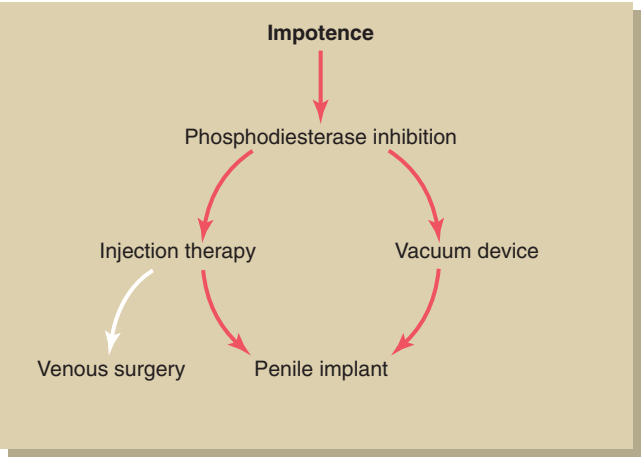

FIGURE 71-2 A logical treatment algorithm for impotence.